

Do PCBs Contribute to Childhood Leukemia? with Mary H. Ward

Ernie Hood

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Although childhood leukemia is the most common childhood cancer, little is known about its causes. Incidence of acute lymphocytic leukemia, the most common childhood leukemia, is highest in industrialized countries and rose significantly between 1975 and 2004, suggesting environmental agents may play some role. In this podcast, Mary H. Ward explores the idea that polychlorinated biphenyls (PCBs) could be one such agent. Ward is the lead author of "Residential exposure to polychlorinated biphenyls and organochlorine pesticides and risk of childhood leukemia" and a senior investigator in the Division of Cancer Epidemiology and Genetics at the National Cancer Institute in Bethesda, Maryland.

AHEARN: It's *The Researcher's Perspective*. I'm Ashley Ahearn.

Just 3,500 cases of childhood leukemia are diagnosed each year, making it a fairly uncommon disease in the overall population. But this cancer, which develops in bone marrow, is one of the most common cancers afflicting children.

Research has shown that some childhood leukemia cases are genetically related, but for the vast majority of cases, doctors don't know where to place blame.

More and more research is pointing the finger at environmental factors such as exposure to certain manmade chemicals like polychlorinated biphenyls, or PCBs.

Dr. Mary H. Ward is a senior investigator in the Division of Cancer Epidemiology and Genetics at the National Cancer Institute. Along with principal investigator Patricia A. Buffler and others at the University of California, Berkeley, Dr. Ward led a case-control study of children in 35 counties in California, which measured levels of PCBs and pesticides in the home. Then they evaluated the association between those levels and childhood leukemia.¹

They found that detecting one or more PCBs in house dust was associated with about twice the risk of acute lymphocytic leukemia, the most common form of childhood leukemia. On the other

hand, organochlorine pesticides such as DDT and chlordane were not. The association was strongest among non-Hispanic whites.

Science writer Ernie Hood talked with Dr. Ward about the implications of the Northern California Childhood Leukemia Study.

HOOD: What led you to suspect that residential exposure to PCBs might significantly increase the risk of that particular disease?

WARD: Well, there's a couple of reasons. One is that prior studies of adult blood tumors, lymphomas in particular, had found an association between PCB exposures measured in blood or serum, as well as in house dust in one study. Also, we know that these chemicals persist indoors in carpets, where they're protected from degradation by sunlight, moisture, and microorganisms. So even though these chemicals have been banned for now over 30 years, they persist in the indoor environment.

HOOD: Dr. Ward, what do you see as potentially the wider implications of the finding that you had in this study that PCBs are sometimes present in household dust and are causing children to be exposed?

WARD: Well, we know there's not as much known about sources of PCBs in the homes as there is, say, for other contaminants like lead, where we know that the source is mainly from lead in paint that was used in the past. There's just now beginning to be a little bit of research in this area that shows PCBs were used in floor finishes back in the '50s and '60s, and there's a couple of studies now that have seemed to pinpoint homes with very high levels were related to recent refinishing of these floors that were likely to have used floor finish that contained high levels of PCBs.²

PCBs were also used in caulking in commercial buildings and possibly in homes. They're also found in old fluorescent light fixtures, and certainly they were present in industrial sites, so if a home had been previously built where there was contamination outdoors from industrial sources, that could be a source.

This isn't as nearly as well studied as some other contaminants, and it's not really clear what the sources are. We do know from our data that PCB levels were found at higher concentrations in older homes; in other words, homes that were built before 1980, before these chemicals were banned.

HOOD: Is household carpet dust itself a potentially significant source of exposures to harmful chemicals such as PCBs?

WARD: Carpet dust can be a potential source of exposure, particularly for children, who spend most of their time indoors—young children who spend most of their time indoors and frequently put their hands in their mouths. We also know for these persistent organochlorine compounds that diet is an important route of exposure as well.

HOOD: What further research would you like to see to expand our knowledge about the potential role of exposures to PCBs in childhood leukemia?

WARD: Well, I think we need to do further studies. Because childhood leukemia is so rare, that isn't such an easy thing to do, but in the Northern California Childhood Leukemia Study, case ascertainment is ongoing, and hopefully we'll have an opportunity to evaluate this in cases and controls identified in the future. Also we'll look for opportunities to evaluate this hypothesis in other study populations. And I think an important area of research is really to understand whether residential concentrations really are a good predictor of exposure in terms of serum levels of these chemicals, and what proportion of exposures come from house dust exposure for children, as opposed to other sources like diet and breastfeeding from their mothers.

AHEARN: That was Dr. Mary H. Ward talking with science writer Ernie Hood. Dr. Ward is a senior investigator in the Division of Cancer Epidemiology and Genetics at the National Cancer Institute.

And that's *The Research's Perspective*. I'm Ashley Ahearn. Thanks for downloading!

References

1 Ward MH, et al. Environ Health Perspect 117(6):1007–1013 (2009); doi:10.1289/ehp.0900583.

2 Potera C. Environ Health Perspect 116(5):A199 (2008); doi:10.1289/ehp.116-a199a.

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